# Areas of Conservation Emphasis (ACE) Quick Reference Guide

*Last updated 10/07/2019*

Areas of Conservation Emphasis (ACE) is a California Department of Fish and Wildlife (CDFW) effort to analyze large amounts of map-based data in a targeted, strategic way. The ACE maps provide a coarse-level view of information important for advancing conservation planning goals, summarized in a standard hexagon grid and by watershed, in five categories: Biodiversity, Significant Habitats, Connectivity, Climate Resilience, and Recreation. ACE provides overarching summary datasets for each category. In addition, ACE provides the components that were developed to build each summary, including species data summarized by taxonomic group, data by significant habitat type, terrestrial and aquatic summaries, and links to original source datasets. Users can choose the type of information and level of detail that best meets their needs. *Please note that ACE is continually updated, and the information in this document expected to change over time. Please check back for changes.*

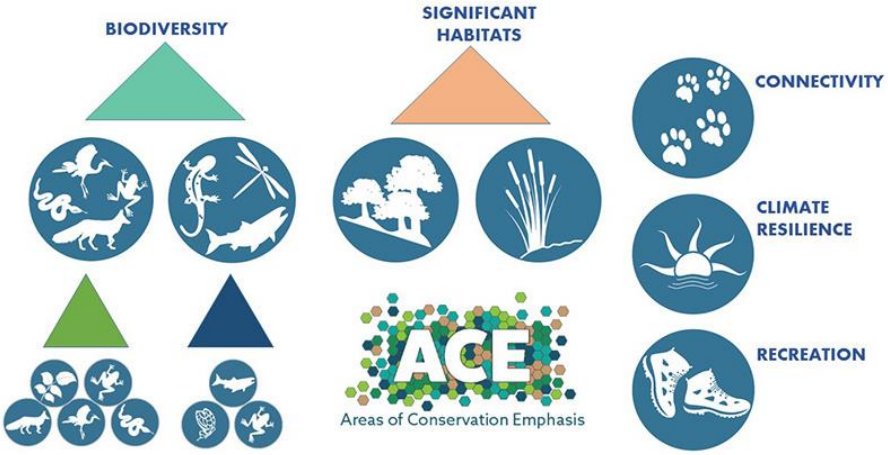


**Figure 1. ACE Model Framework** shows the five categories of ACE data, and the major components used to build the model, including terrestrial and aquatic biodiversity and significant habitat datasets, and species dataset by taxonomic group.

This quick reference guide provides a brief overview of the available ACE maps and associated data, along with examples of the types of questions that can be answered with the data. More information can be found on our website [https://www.wildlife.ca.gov/Data/Analysis/Ace]. The ACE maps can be viewed and downloaded using the ACE Viewer [https://apps.wildlife.ca.gov/ace/]. Data on State Wildlife Action Plan (SWAP) priorities, land conservation status, and environmental stressors, are also available in the ACE viewer.

Note that ACE does not replace the need for site-specific evaluation of biological resources and should not be used for regulatory purposes. All ACE data layers are limited by the accuracy, scale, extent of coverage, and completeness of the input data at the time they were run, and users should review the associated metadata and Fact Sheets before interpreting the data.

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# Examples of questions that can be answered with ACE datasets

Biodiversity:

- How does the biodiversity in a given area compare with the rest of the ecoregion and the rest of the state? How does the biodiversity in a given area compare with biodiversity of another location?
- How many native, rare, and endemic species in each taxonomic group are found (or are modeled to occur based on potential suitable habitat) in a given area? [Biodiversity summaries and datasets]
- How do the numbers of native, rare, or endemic birds, mammals, amphibians, reptiles, plants, etc., found in an area compare with the numbers found across the rest of the ecoregion and the rest of the state? How do the numbers of species compare between two locations of interest? [Biodiversity datasets by taxonomic group]
- How "irreplaceable" is a particular location? Highly irreplaceable areas support narrowly distributed endemic species (i.e., few or no other areas in the state support the same suites of species). How does the irreplaceability of a given area compare with other locations? [Irreplaceability]
- How many climate-vulnerable species are modeled to occur in a given area? [Terrestrial Climate Vulnerable Species]
- How many game species are modeled to occur in a given area? [Terrestrial Game Species]
- Which species occur in this area? [Species Lists: documented species based on occurrence data and predicted species based on models]

Significant Habitats:

- How many significant habitat types have been mapped within a given hexagon or watershed?
- What significant habitat types have been mapped within a given hexagon or watershed?
- Which source maps have mapped significant habitat within the hexagon or watershed?

Connectivity:

- Has connectivity habitat, including large natural landscape blocks, corridors, and/or linkages, been identified within the hexagon?
- Which studies/maps have identified important connectivity habitat within the hexagon?

Climate Resilience:

- To what extent has habitat in the hexagon been identified as climate change refugia?

For a full list of maps and information: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=160957

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## List of ACE Maps and Information Available in Associated Data Tables

*Click on the dataset name to link to its fact sheet, which contains a full dataset description, list of data sources, data processing steps, and dataset table field definitions.*

### 1. Species Biodiversity

Maps: Show the distribution of biodiversity across the state.

Dataset Table: Full list of final ACE ranks for the area (hexagon and watershed). Ranks are provided both statewide (relative rank compared with rest of the state) and ecoregional (relative rank compared with the rest of the ecoregion). The map is symbolized on Ecoregion biodiversity weight, which is the percentile biodiversity value of the area, combining both aquatic and terrestrial data.

*For example:*
Ecoreg Biodiversity Rank = 5. The location is part of the top 20% of area in the ecoregion with the highest biodiversity values.
Ecoreg Biodiversity Weight = 0.77. The biodiversity value for the area represents 77% of the maximum measured biodiversity value in the ecoregion.

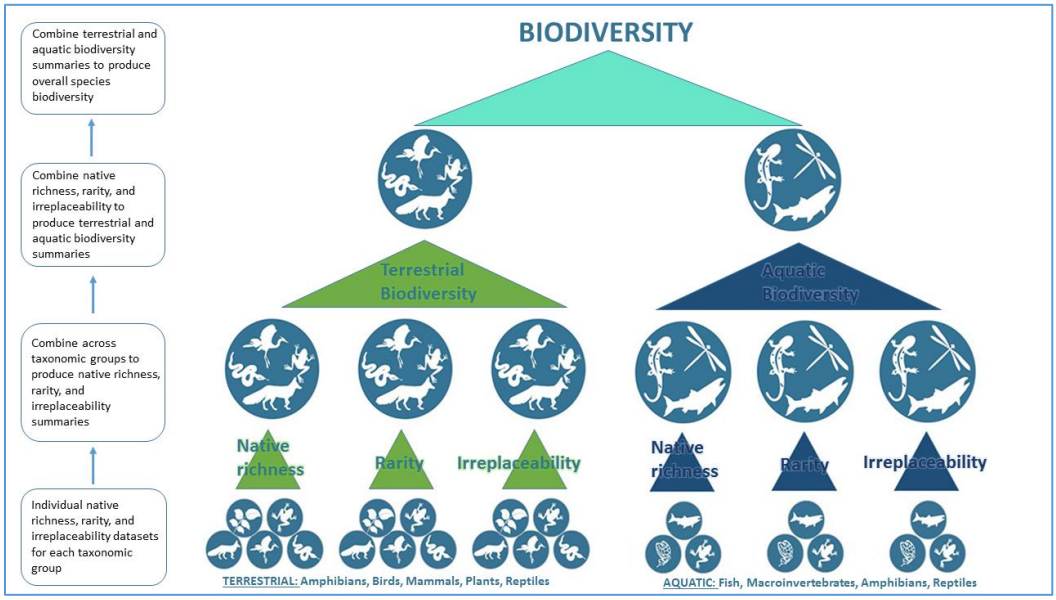


**Figure 2. ACE Biodiversity Model Framework** shows how the ACE Biodiversity data was compiled. Each of the component datasets is available for viewing and download from the ACE viewer.

### 2. Terrestrial and Aquatic Biodiversity Summaries

Maps: Show the distribution of aquatic and terrestrial biodiversity separately.

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Dataset Table: Ranks and weights for biodiversity, native richness, rare species richness, and irreplaceability. Species counts for native species, rare species, and endemic species.

**3. Terrestrial and Aquatic Species Lists**

Maps: Same as biodiversity summaries.

Dataset Table: List of species that contributed to the species counts, including whether the information used was an observation or a model, and whether each species is rare, endemic, climate vulnerable, and/or a game species. *Note that only verified field observations of rare and endemic species were used to develop the rarity and irreplaceability data layers. Modeled species distributions/ranges were not included in the rarity and irreplaceability data layer development.*

**4. Terrestrial Biodiversity Datasets (Native Species Richness, Rarity, Irreplaceability)**
**Aquatic Biodiversity Datasets (Native Species Richness, Rarity, Irreplaceability)**

Maps: Show each component of biodiversity (native richness, rare species richness, and irreplaceability ) across the state. Separate maps of climate vulnerable and game species diversity are also included here.

Dataset Table: Ecoregion rank and weight, and counts of species for each taxonomic group. This information is also available in the tables for the terrestrial and aquatic biodiversity summary layers.

**5. Biodiversity Datasets by Taxonomic Group**

**Terrestrial Biodiversity Datasets (Native Species Richness, Rarity, Irreplaceability) for Amphibians, Birds, Mammals, Plants, and Reptiles**

**Aquatic Biodiversity Datasets (Native Species Richness, Rarity, Irreplaceability) for Aquatic Amphibians, Macroinvertebrates, Reptiles, and Fish**

Maps: Show each component of biodiversity (biodiversity, native richness, rare species richness, and irreplaceability ) for each individual taxonomic group (birds, mammals, amphibians, plants, reptiles, fish, and aquatic macroinvertebrates) across the state.

Dataset Table: Species counts by taxonomic group, and statewide and ecoregional weights by taxonomic group. The species counts are available elsewhere, but the weights by taxonomic group are only available by looking at each taxonomic group layer.

The weights represent the percentile values for the taxonomic group, available both statewide and ecoregionally.

*For example*: Ecoregion mammal species richness weight = 0.77 indicates that the mammal species richness value of that area is 77% of the highest-value area in the ecoregion. Statewide mammal

species richness weight = 0.77 indicates that the mammal native richness value is 77% that of the highest mammal richness area in the state. *Note: It does **not** mean it provides habitat for 77% of all mammal species present in the ecoregion or state.*

**6. Terrestrial and Aquatic Significant Habitats Summaries**

Map: Shows the relative density of significant habitat types mapped across the state.

Dataset Table: Gives a checklist of significant habitat types that have been mapped within the hexagon or watershed. Significant habitat rank and weight gives a relative value, showing the relative number of significant habitat types that have been mapped in the hexagon or watershed compared with all hexagons or watersheds statewide.

**7. Terrestrial and Aquatic Significant Habitat Datasets**

Maps: Show the distribution of each significant habitat type across the state by hexagon or watershed.

Dataset Table: Provides the user with a list of original vegetation and landcover maps (by BIOS number) that mapped a particular significant habitat type within a given hexagon or watershed. The BIOS number can be used to add the BIOS dataset as an overlay into the ACE viewer. A crosswalk of BIOS numbers and dataset names is provided in the fact sheet for each dataset.

**8. Connectivity**

Map: Shows a compilation of linkages, corridors, and natural landscape blocks identified in statewide and regional connectivity studies.

Dataset table: Provides the user with a list of original connectivity studies (by BIOS number) that have identified corridors or linkages in the hexagon, as well as metrics that assess the regional connectivity context of an area, including (a) whether it is part of a mapped linkage or species corridor; (b) how much of the area is part of a large, contiguous block of natural habitat; (c) whether the area has been assessed in a fine-scale linkage study; (d) how much of the area is channelized (TNC 2018); and (e) the species for which high priority movement areas have been identified in this location.

Each hexagon is ranked into one of the following categories based on the identification of corridors and linkages in statewide, regional, and species-movement studies: 5) Irreplaceable and essential corridors; 4) Conservation planning linkages; 3) Connections with implementation flexibility; 2) Large natural habitat areas; or, 1) Limited connectivity opportunity.

**9. Climate Resilience**

Map: Shows climate resilient areas, ranked from low to high, based on a climate change vulnerability assessment of California's vegetation (Thorne 2016; https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=116208&inline).

Dataset Table: Shows the mean climate resilience score (decimal between zero and one, where one is the highest climate resilience) averaged over eight future climate scenarios, and weighted by area. Highest scoring areas are resilient across all eight potential future climate scenarios. The tables also show the percent of the hexagon assessed. (The study did not assess areas mapped as urban, agricultural, or open water.)

**10. Terrestrial and Aquatic SWAP Targets**

Maps: Shows State Wildlife Action Plan (SWAP) terrestrial and aquatic targets across the state. Note that ACE model above must be turned off or opacity reduced to see SWAP target map.

Dataset tables: SWAP province and conservation unit, SWAP conservation target name, associated chapters and page numbers in SWAP document, other potential SWAP targets that could be present in the area.

**11. Stressors**

Maps: Sea level rise and urbanization (projected land use change). Additional stressor maps will be added during ACE 3, Phase 2 development (expected 2019).